

# Completion of Intravenous Fluids Administration Regimen by Nurses Working in Adult Medical and Surgical Wards at a County Referral Hospital, Kenya

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## Abstract

**Introduction:** Intravenous fluids are administered to patients in order to correct the status of their body fluids or electrolytes. Correct and complete intravenous fluid volume administration practices are critical in prevention of complications related to intravenous fluids therapy. **Study objective:** To assess the completion of intravenous fluid administration regimen by nurses working in adult medical and surgical wards at a County Referral Hospital in Kenya. **Methodology:** Descriptive cross-sectional study design was used to collect data from the 52 randomly selected nurses using self-administered semi-structured questionnaires. An observational checklist was used to collect data on completion of intravenous fluid administration regimen from the patients' fluid balance charts. Relevant approvals/ authorities to collect data were also obtained. **Results:** The prescribed fluid volumes were administered in only 34.2% of the patients. **Conclusion:** Completion of intravenous fluid administration among the patients was suboptimal.

**Keywords:** Intravenous fluids, Administration, Completion.

## 1. Introduction

Intravenous (IV) fluid therapy is used to deliver fluids, medications, blood products and other substances directly into the body circulatory system and is one of the most common invasive procedures performed on hospitalized patients worldwide. Approximately 25 million people receive IV therapy by use of an intravenous cannula globally<sup>1</sup>. IV fluids are mainly administered to sick hospitalized patients for body fluid replacement or maintenance<sup>2</sup>. Most of the patients receive maintenance IV fluids to prevent dehydration, prevent or manage hypovolemia, correct acid-base and electrolyte imbalance or as a vehicle for nutritional or pharmaceutical agents<sup>3</sup>. IV fluids therapy is an integral aspect of nursing practice and can range from caring for a peripheral cannula to multiple and complex intravenous infusions and related equipment<sup>4</sup>. The necessity for administration of complete fluid prescription volumes to patients over the correct duration and documentation in the patients' fluid administration charts calls for a need to assess the nurses' practice on administration of IV fluids. This formed the basis of this study to assess the completion of IV fluid administration practice by nurses in the adult medical and surgical wards at Thika Level 5 Hospital, in Kenya.

### 1.1 Study objective

The objective of this study was to assess the completion of intravenous fluid administration regimen by nurses working in adult medical and surgical wards at a County Referral Hospital in Kenya

## 2. Literature review

Several studies of hospitalized patients on IV fluid therapy have suggested that IV fluid administration and monitoring practices are not up to the required standards. Another study established that monitoring patients' fluid balance to prevent dehydration or over-hydration was performed correctly, but fluid balance charts were not completely updated<sup>5</sup>. An audit on the completion of fluid balance charts by nurses in different wards established that the major reasons for incomplete fluid balance charts were staff shortages, lack of training, and lack of time<sup>6</sup>. A study to assess the determination of record keeping behavior of nurses regarding IV fluid administration among 150 nurses working at the adult clinics of a 936-bed university hospital established that the most frequently documented entries were the solution type, total volume prescribed and date of treatment<sup>7</sup>. According to a prospective study conducted at a teaching hospital in Australia on 398 in-patients, 26% of them were receiving IV fluids yet fluid balance charts were maintained for only 94% of the patients who were on IV

fluid administration<sup>8</sup>. This was despite the fact that fluid balance charts are important for the recording and calculation of fluid volumes administered to and lost by patients, which forms a baseline to inform clinical decisions making on patient care<sup>9</sup>.

### 3. Study Methodology

#### 3.1 Study design

Descriptive cross-sectional study design was used to collect data from 52 nurses and 95 patients' fluid balance charts, using simple random sampling method.

#### 3.2 Validity and reliability of the data collection tools

Validity of the data collection tools was done by pre-testing of the questionnaires and observational checklist and adjustments done accordingly. To ensure study reliability, data was counter-checked during entry for completeness.

#### 3.3 Data collection

Quantitative data was collected by use of self-administered semi-structured questionnaires while an observational checklist was used to collect data on completion of IV fluid administration from the patients' fluid balance charts.

#### 3.4 Data analysis

Qualitative and quantitative data were summarized to identify patterns and interpret meanings. The data was sorted into a framework, coded and data entry done using the software program Nvivo to search for keywords or strings, classify, sort and arrange data. Descriptive analysis of the range of responses in categories was done and recurrent themes identified. Quantitative data was converted to numerical form and subjected to statistical analysis using the SPSS software version 22. Bivariate analysis was done to determine relationships between variables ( $P \leq 0.05$ ).

#### 3.5 Ethical clearance

Research ethical approval was obtained from the Mount Kenya University Ethics and Research committee, National Commission for Science Technology and Innovation (NACOSTI) and the research committee at Thika Level 5 Hospital. Permission for data collection was sought from the Nursing officer in-charge of the hospital and wards. Informed consent was obtained from the study participants.

### 4. Study results

#### 4.1 Socio-demographic characteristics of the respondents

Table 1: Respondents' qualifications

Level of Training	Frequency	Percentage
Certificate Level	2	3.8
Diploma Level	41	78.8
Degree Level	9	17.3
Total	52	100.0

Majority, 41(78.8%), of the respondents had Diploma level of training, 9 (17.3%) were degree holders while 2 (3.8%) had certificate level of training (Table 1).

Table 2: Respondents' years of experience

Duration	Frequency	Percentage
Below 5 years	6	11.5
5-10 years	3	5.8
11-20	13	25.0
Above 20 years	30	57.7
Total	52	100

Table 2 shows that 30 (57.7%) of the respondents had practiced for over 20 years, 13 (25.0%) had been in practice for 11-20 years, 6 (11.5%) had worked for less than 5 years while 3 (5.8%) of the respondents had an experience ranging between 5 to 10 years.

#### 4.2 Completion of intravenous fluids administration regimen

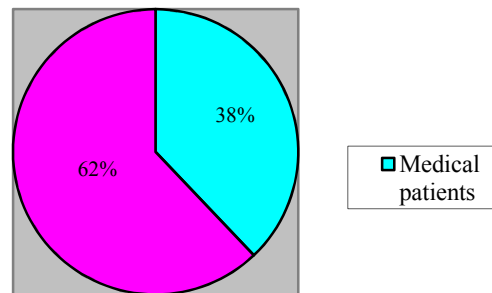


Figure 1: Patients' wards

The researcher used an observational checklist to ascertain whether certain requirements for completion of IV fluid administration regimen to patients were met. On average, 36 (38%) of the patients at the medical wards were receiving IV fluids daily while 59 (62%) of them belonged to the surgical wards (figure 1 above). The findings obtained from the observational checklists indicated that 83 (88.3%) of the fluid charts had patient's name and Hospital identification completed. However, 60 (64.1%) patient's fluid charts had the patient's name indicated but lacked the hospital identity number. The patient's weight was documented in only 19 (20.2%) of the examined patients' fluid charts. The patients' fluid balance charts lacked a provision for age and nurse's name and signature and therefore no entries (0%) had been made. Majority, 94 (98.9%), of fluid charts had the prescribed fluid indicated and documentation of the time IV fluids were started in 68 (71.3%) charts. The input-output fluid balance was documented in only 43 (45.6%) charts. The total prescribed IV fluids volume administered was less in 54 (57.4%) and more in 7 (8.4%) of the patients' as established from the fluid balance charts. Only 32 (34.2%) patients received the prescribed IV fluid volumes. Above 55 (58.3%) patients had IV fluids infused over a longer time, 15 (16.0%) took less time while 24(25.5%) had no IV fluid infusion duration indicated.

#### 5. Discussion

Findings from this study on the proportion of patients at the medical and surgical wards receiving IV fluids concur with those of a study carried out on hospitalized patients whereby 25% of them were on IV fluids<sup>10</sup>. From this study 21% and 41% of the patients at the medical wards and surgical respectively were receiving IV fluids. The findings of this study indicated that the patients' body weights were documented in only 20.2% of the examined patients' fluid charts. Similar results were realized other studies in which case only 15% of the patients had their body weights documented<sup>11, 12</sup>. The low proportions of documented body weight measurements are consistent with those of a study on a US cohort of patients receiving IV fluids<sup>13</sup>. In this study, only 28% of orthopedic patients and 22% of medical patients were receiving IV fluids. These variations in the patients' body weight measurement practices by nurses were undesirable because use of patients' body weights inform clinical decisions including medication dosages and patient monitoring for IV fluid-related complications. Findings of this study on documentation of the patients' details showed that 88.3% of the fluid charts had patient's name and Hospital identifications completed, 64.1% had the patient's name entered but lacked the hospital identity number. This indicated inconsistencies in the proper documentation of the key patient identifiers which are crucial in prevention of medication errors. In addition, the patients' fluid balance charts lacked a provision for age and nurse's name and signature and therefore no entries had been made. Majority 98.9% of fluid charts had the prescribed IV fluid indicated and documentation of the time that the IV fluids were started in 71.3% of the charts. This indicated a gap in the complete documentation of the patients' fluid balance charts. Findings from this study on the proportion of patients who received the complete prescribed IV fluid volumes (34.2%) negates those of an observational audit of IV fluid therapy-associated morbidity in a cohort of general medical and surgical patients whereby 85% of the patients receiving IV fluids had the correct prescribed volumes administered<sup>5</sup>. The findings attributed the incidence of iatrogenic morbidity to excessive IV fluid administration, incomplete fluid charts of the patients undergoing IV fluid therapy, among others.

#### 6. Conclusion and recommendations

##### 6.1 Conclusion

Nurses in the wards were monitoring patients using fluid balance charts, but documentation in the charts was incomplete, with no documentation in some of the charts. The study also established that administration of the prescribed IV fluids volumes over the correct duration was minimal.

## 6.2 Recommendations

Hospitalized patients receiving IV fluids require proper administration and monitoring for potential complications associated with this form of therapy. The hospital administration should put in place measures to ensure that patients receive correct prescribed IV fluid volumes over the correct duration.

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